

In the Claims:

1. (Currently Amended) An adsorbent, ~~characterized by preferential adsorption of gaseous alkene from a gaseous mixture comprising said alkene, said adsorbent comprising:~~

a carrier;

a silver compound supported on a the carrier, said silver compound selected from the group consisting of acetate, benzoate, bromate, chlorate, perchlorate, chlorite, citrate, fluoride, nitrate, nitrite, and sulfate; said silver compound adapted to preferentially releasably retain gaseous alkenes from a gaseous mixture comprising said alkenes; and said carrier being characterized by a BET surface area greater than about 50 square meters per gram and up to about 2,000 square meters per gram and comprising a plurality of pores having size greater than about 3 angstroms and up to about 10 microns.

2. (Original) The adsorbent of claim 1 wherein said adsorbent comprises finely divided particles of silica (SiO_2) with silver nitrate (AgNO_3) dispersed on and supported on said particles.

3. (Original) The adsorbent of claim 1 wherein said carrier is selected from the group consisting of refractory inorganic oxide, molecular sieve, and activated carbon in particle form.

4. (Presently Amended) The adsorbent of claim ~~1~~ 3 wherein said refractory inorganic oxide is selected from the group consisting of pillared clay, alumina and silica.

5. (Original) The adsorbent of claim 3 wherein said molecular sieve is a carbon molecular sieve or a zeolite molecular sieve.

6. (Currently Amended) An adsorbent, ~~characterized by preferential adsorption of gaseous alkene from a gaseous mixture comprising said alkene, said adsorbent comprising:~~

a carrier;

a copper salt impregnated within the carrier; a salt of the copper salt selected from the group consisting of bromide, fluoride, iodide and sulfate, said copper salt adapted to preferentially releasably retain gaseous alkenes from a gaseous mixture comprising said alkenes; said carrier selected from the group consisting of refractory inorganic oxide, molecular sieve, and activated carbon, and characterized by a BET surface area greater than about 50 square meters per gram and up to about 2,000 square meters per gram and comprising a plurality of pores having size greater than about 3 angstroms and up to about 10 microns.

7. (New) An adsorbent, comprising:

a carrier;

at least one of a copper compound and a silver compound supported on the carrier, the at least one of the copper compound and silver compound selected from the group consisting of acetate, benzoate, bromate, bromide, chlorate, perchlorate, chlorite, citrate, fluoride, nitrate, nitrite, sulfate, and iodide; the at least one copper compound and silver compound adapted to preferentially releasably retain gaseous alkenes from a gaseous mixture comprising said alkenes at a selected temperature and pressure; and the carrier being characterized by a BET surface area greater than about 50 square meters per gram and up to about 2,000 square meters per gram and comprising a plurality of pores having a size greater than the molecular diameter of the alkene.

8. (New) The adsorbent of claim 7 wherein the at least one copper compound and silver compound is water soluble.

9. (New) The adsorbent of claim 7 wherein said carrier is selected from the group consisting of refractory inorganic oxide, molecular sieve, and activated carbon in particle form.

10. (New) The adsorbent of claim 9 wherein said molecular sieve is a carbon molecular sieve or a zeolite molecular sieve.

11. (New) The adsorbent of claim 7 wherein the silver compound is silver nitrate and the carrier is silica.

12. (New) The adsorbent of claim 7 wherein the copper compound is selected from group consisting of bromide, fluoride, iodide, and sulfate.

13. (New) The adsorbent of claim 7 wherein the plurality of pores have a size greater than about 3 angstroms and up to about 10 microns.

14. (New) The adsorbent of claim 7 wherein the at least one of the copper compound and silver compound is adapted to form π -complexation bonds with the gaseous alkenes.

15. (New) The adsorbent of claim 7 wherein the selected temperature at which the gaseous alkenes are preferentially releasably retained ranges between about 0°C and about 50°C.

16. (New) The adsorbent of claim 7 wherein the selected pressure at which the gaseous alkenes are preferentially releasably retained ranges between about 1 atmosphere and about 35 atmospheres.

17. (New) The adsorbent of claim 7 wherein the gaseous alkenes are selected from a group consisting of ethylene, propylene, and mixtures thereof.

18. (New) The adsorbent of claim 1 wherein the silver compound is adapted to form π -complexation bonds with the gaseous alkenes.

19. (New) The adsorbent of claim 6 wherein the copper salt is adapted to form π -complexation bonds with the gaseous alkenes.